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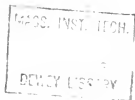
IMPLICATIONS OF LEARNING STYLE FOR THE  
CHOICE OF A PRIMARY CARE CAREER IN MEDICAL SCHOOL\*

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IMPLICATIONS OF LEARNING STYLE FOR THE  
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Amid a national debate concerning the types of physicians this country needs, or more specifically, the need for more primary care physicians, we find that there are many unanswered questions concerning the process of producing one kind of physician or another. The question of the process of medical education goes beyond a concern for students acquiring the requisite clinical knowledge and skills to practice certain kinds of medicine. The process of career preparation includes the more subtle dynamics affecting the development of individual biases that influence medical students towards alternate career paths. In short, there is a need to know more about the way in which medical students make their choices of specialty and type of medical career.

There has been considerable research concerning the general process of medical education, and some studies of the influence of medical education on medical career choice. To date the research in the area of medical career choice has led to two somewhat contradictory findings:

(1) cognitive and/or other personality characteristics of medical students result in an inclination towards certain specialties irrespective of the medical education process (1, 2); or

(2) medical career decisions are influenced primarily by a variety of factors within and outside of the medical school environment including faculty (3), clinical experiences (4), preceptorships (5), the general medical school ambience (6,7), and/or the outside environment (8).

The study described in this paper demonstrates that in fact medical



career decisions are associated with personality and environmental variables, and the influence of the environment in the individual is interactive with these personality variables. Using an inventory called the Learning Styles Inventory (LSI) (9) to measure students' learning styles, this study discovered that students with different learning styles are a statistically distinct group in careers in different specialties or types of medicine, and is influenced by different factors (e.g., courses, role models, etc.) in medical school in making their career decisions, than reversing their initial inclinations. Although the study was performed in only one medical school and with a small sample of students, the results indicate that there is an interaction between individual dispositions and environmental influence sources in medical career choices has important implications for medical career decision making and medical education.

Learning Styles

Learning style, as the aspect of cognitive style, is a total refers to a person's characteristic style of acquiring and using information in learning and/or solving problems. There is a great deal of evidence from the behavioral sciences that people can vary in cognitive style along a number of different dimensions (10). There is also a great deal of evidence that these cognitive style differences between people can lead them to choose different kinds of careers where their cognitive preferences will be best accommodated (11). For example, a career in basic science would be more comfortable to someone with a logical, analytic bent, while a social scientist might be better suited with a more concrete, intuitive, present-oriented style.

Learning style differences, as the dimension of cognitive style, have been associated with different career choices in several studies of career choice in non-medical settings (4, 11). These encouraging results led to the



use of the Learning Style Inventory in this study of medical career choices.

The LSI was developed by Kolb (9) to measure preferences on what were theorized to be the four modes involved in the learning and/or problem solving cycle: 1) the concrete experiencing of events, situations, etc.; 2) the observation of and reflection on these events; 3) the forming of abstract conceptual constructs concerning these observations; and 4) the active implementation of these conceptual theories or constructs in everyday behavior, leading back to the concrete experiencing of events (9).

Each mode represents one learning/problem-solving style that is in contrast and conflict with its opposite pole on the two dimensions of style (abstract-concrete and active-reflective). Through heredity, experience and environmental demands people develop strengths, or styles that emphasize some of these learning modes over others. Four types of learners are defined based on their predominant styles: the Assimilator, the Accommodator, the Converger, and the Diverger (see Figure 1). Using scores on the two dimensions of style, people can generally be defined as approximately one of these four types.



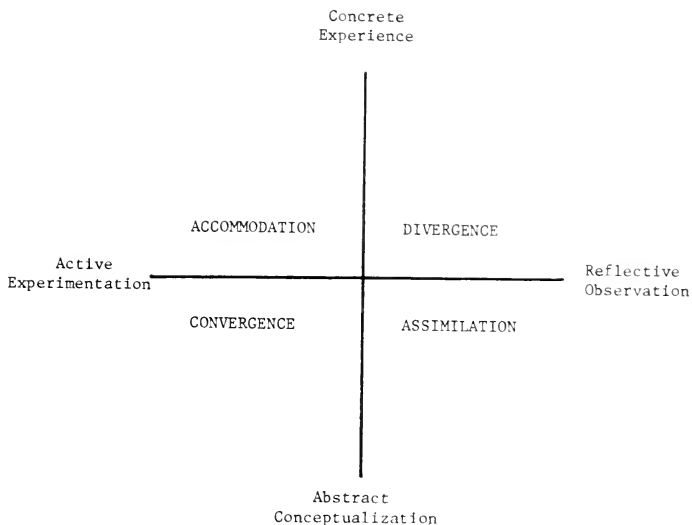


Figure 1. Learning Styles and the Learning Process.

The Converger is defined as having dominant learning modes of Abstract Conceptualization (AC) and Active Experimentation (AE). His tendency is towards the practical application of ideas. People with this style are reported to do best in those situations like conventional intelligence tests where there is a single correct answer or solution to a question or problem (13). Kolb's (12) research shows that this learning style is characteristic of many engineers.

The Diverger is defined as having the opposite learning style from the converger. He prefers Concrete Experience (CE) and Reflective Observation (RO). He likes to view concrete situations from many perspectives, ergo the label "diverger." Studies in industry show that this style is characteristic of



managers from humanities and liberal arts backgrounds (12). These studies also found that personnel managers tend to be characterized by this learning style.

The Assimilator's dominant learning modes are Abstract Conceptualization (AC) and Reflective Observation (RO). Assimilators are defined as preferring inductive reasoning in assimilating disparate observations into an integrated theoretical explanation (9). Like the converger, the assimilator is interested in abstract concepts, but he is less concerned with the practical use of these concepts or theories. As a result, this learning style is more characteristic of the basic sciences rather than the applied sciences. In industrial organizations this learning style was found most often in the research and planning departments (12).

The Accommodator has the opposite learning styles of or from the assimilator. His preference is for Concrete Experience (CE) and Active Experimentation (AE). As defined, he likes doing things, carrying out plans and experiments and involving himself in new experiences (9). In situations where the theory or plan do not fit the "facts," he will most likely discard the plan or theory. (His opposite style type, the assimilator, would be more likely to disregard or to re-examine the facts.) In organizations people with this learning style are found in "active-oriented" jobs, often in marketing or sales (12).

#### Construction of the LSI

The form of the LSI is a nine-item self-description questionnaire. Each item asks the respondent to rank order four words in the way that best describes his learning style. One word in each item corresponds to one of the four learning modes -- Concrete Experience (sample word, feeling), Reflective Observation (watching), Abstract Conceptualization (thinking), and Active Experimentation (doing). The words were selected by a panel of four behavioral scientists



acquainted with the theory. An attempt was made to balance the four words in each item on their social desirability, that is, they tried to use words that represented equally desirable qualities for one to possess.

At this point the LSI is a measure of people's perceptions of their own preferences for different modes of behaving (i.e. learning). The disadvantage of this type of test is that people may be indicating their idealized self-image in the LSI rather than their actual self-image. On the other hand, in terms of measuring or predicting career choices, the idealized self-image may be a more relevant measure.

### Method

The study was designed to determine what effects, if any, learning styles, as measured by the LSI, have on (a) the type of medical career medical students are attracted to, and (b) the process by which medical students arrive at a career decision. Questionnaires were sent to all freshmen and seniors in a large eastern medical school. These questionnaires asked the students a variety of questions concerning their career plans. The questionnaires also contained an LSI to be filled out by the student.

In addition to the questionnaire, a sub-sample of 27 senior medical students were randomly selected for an interview concerning how they had come to their current career decisions. The interview was designed to elicit more in-depth information on the process of career decision-making in medical school.

### Results

#### The Process of Choice

The results of the interviews indicated that students with different learning styles seemed to be influenced by different aspects of their environment in making career choices (see Table 1). Specifically, concrete types (accommodators



and divergers) seemed to be affected more than the other LSI types by work experiences and by identification with attractive role models. Assimilators, on the other hand, were influenced more than the other LSI types by their course work and by the intellectual content of the work they were going into. Finally, convergers seemed more inclined towards scanning across various role models as a means of collecting data relevant to their career decisions.

These results suggested that attention has to be directed at the process of medical education as well as at the type of students being admitted to medical school to fully understand the career choices being made.

### Career Choices

The results concerning actual career choices indicate that different types of medical careers become associated with certain predictable learning styles (see Table 2). Family medicine and primary care careers were chosen more by accommodators, and by divergers, as were surgical careers. Internal medicine specialties and sub-specialties were chosen more often by convergers. Academic medicine and pathology were selected more by assimilative students.

The results can perhaps be best understood by noting that abstract students (convergers and assimilators) were in fact found in those careers characterized as being more intellectually oriented, often having a substantial research component (specialties and sub-specialties in medicine, academic medicine, and pathology). Correspondingly, concrete students' (accommodators and divergers) career choices were more often in fields characterized by a less intellectual, more intuitive, "here-and-now" orientation (family care, primary care, surgery).

Unfortunately there were too few diverger careers (i.e. psychiatry) chosen by the students in this study to enable differentiation between the choices of concrete-active and concrete-reflective students. However, it was possible to



Table 1      Percentage of Cases in Which Factors were Identified as a  
First, Second, or Third Most Important Career Choice  
Influence by Seniors of Different Learning Styles.

	Accommodators	Divergers	Convergers	Assimilators
1. Work Experiences in Health Care	100%*	100%	50%	20%
2. Identification With One Role Model	67%	55%*	50%	20%
3. Scanning Across Several Role Models	11%	44%	75%*	0%
4. Intellectual Content of Their Work	0%	33%	25%	80%*
5. Courses in Medical School	22%	0%	25%	100%*
	N = 9	N = 9	N = 4	N = 5

\*Hypothesized as high scores.



Table 2    Percentage Distribution of Career Choices of Different  
Learning Style Types Among Seniors who Indicated  
They were Certain of their Choices

	Accommodators	Divergers	Convergers	Assimilators	Total Sample
1. Family Medicine/ Primary Care	43%*	30%	9%	17%	26%
2. Surgery	36%	30%	27%	8%	25%
3. Psychiatry	7%	10%	0	8%	6%
4. Medicine Specialty	14%	20%	54%*	25%	28%
5. Academic Medicine	0	0	0	25%*	6%
6. Other (Pathology, Radiology)	0	10%	9%	17%*	9%
	100%	100%	100%	100%	100%
	N=14	N=10	N=11	N=12	N=47

\* These were hypothesized to be high frequency choices for the learning style type in question as compared to other learning style types.



distinguish between the choices of abstract-active and abstract-reflective students. The convergers (abstract and active) were found in practitioner careers characterized by frequent patient interaction, while assimilators (abstract and reflective) were found in academic medicine and pathology, careers characterized more by a heavier research component and/or much laboratory work. Thus, both the abstract-concrete distinction and active-reflective distinction between students' learning styles seems to correlate with their career choices.

These results can be interpreted to mean that certain types of medical careers seem to be more appropriate for certain learning styles. However, a student's selection of a specific career from among several appropriate alternatives, or even the selection of an "inappropriate" career type is affected by the student's learning style and the range of environmental influences to which he is subject. For example, an accommodator might need a clinical experience in an area before it could be his career choice.

While this study was performed in only one medical school, and the results are based on a relatively small sample of medical students, there are several important implications that should be discussed.

### Discussion

In this section the implications of the results already reported will be examined along with the presentation of other data relevant to the discussion. What is particularly important about the results of this study is that they seem to indicate that it is just those types of students who seem to prefer the family physician or primary physician roles (accommodators and divergers) who also appear to need work experience and identification with role models to influence them in their career decisions. Yet most of their experiences and



role models in medical school lead them away from these careers.

Within the medical school studied, almost all of the students' actual work experience comes from hospital rotations. This is limiting not only in terms of the type of work and career options the students are exposed to, but also in terms of the different kinds of role models they come in contact with. In most of the hospitals used as clinical rotations in this medical school, non-specialists (primary, family, or general practitioners) are excluded from the wards.

The community medicine faculty who are found in the medical school often focus on such things as population dynamics, or economics -- not attractive role models for would-be healers. In the absence of countervailing forces, the pressure towards "competence" (and money, status, etc.) lead medical students to the only practicing physician role models they are exposed to -- the specialists and sub-specialists they encounter in their hospital rotations.

There are other difficulties in medical school for accommodators and divergers interested in primary care careers. Generally, the abstractions of course work in the first two years of medical school seem to frustrate and discourage them. Forty percent of the accommodators and 54 percent of the divergers in this study indicated they were dissatisfied with their course work at medical school, compared to 19 percent of the assimilators and convergers. Students reported in the interviews that any initial inclinations they had towards family care, or primary care, were strongly questioned by many of the medical school faculty and their peers. For example, several students reported that faculty frequently alluded to the "incompetence" of non-specialists in lectures, discussions, and even in written case studies.

Apparently, there is little in the medical school to encourage the choice of a career in primary care. In this study, while 52 percent of the freshmen



indicated a first choice for family medicine or primary care careers, only 30 percent of the seniors did so. On the other hand, seniors indicated a first choice for academic medicine or sub-specialty practice in 42 percent of the cases compared to only 17 percent for freshmen. In fact, of the seniors who were still interested in becoming family physicians or primary care physicians when interviewed in this study, almost all either had parents who were family doctors, or had experienced family or primary medicine outside of medical school -- in several cases after having dropped out of medical school for a while.

Many of the accommodators and divergers in this study who had initially been interested in primary care careers were channeled into a specialty practice (particularly ob-g, and pediatrics). This is not to say that these types of careers are less desirable than any other. If, however, there is a need for more family and primary physicians, or if there is just an ideological need to provide legitimate "freedom" of choice to these students, then the results of this study should be cause for concern.

### Recommendations

Again, this study was performed in only one medical school with a relatively small sample of medical students. The findings need to be replicated and verified with more schools and more students. However, tentatively, there are certain recommendations that should be noted.

Assuming the dynamics discussed above are accurate, several alternatives come to mind to help provide a more balanced learning environment for medical students, particularly for those interested in primary care careers. One is to provide students with more experiences in primary care settings, preferably sometime before and certainly during the third year. Another is to provide more contact with practicing physicians from non-hospital settings, preferably in courses (as a show of status) as well as in work settings during the first



two years. Third is to bring some experiential relevance to the coursework in the basic medical sciences. Whether this can be done through the use of more cases in the first year or through some form of limited patient contact is a question for consideration. However, accommodators, divergers, and even the more abstract types in most cases consistently found it difficult to learn the course material without a clinical frame of reference. In other words, it is easier for them to study biochemistry if they see its relevance to actual patient problems.

Finally, students in all of the learning style categories were similar with respect to their reported lack of a systematic approach to career planning in medical school. Most students interviewed admitted that the interview was the first time they had systematically evaluated how they had made their career decisions. Almost all reported they had never approached anyone at the medical school for advice or counseling prior to making their career choice, although they had solicited faculty advice on which hospitals to apply to for internships.

This is consistent with the students' relationship to the faculty. Faculty are sources of factual information. However, most students reported difficulty in establishing rapport with faculty and generally felt most faculty were not concerned with student needs or development but rather with their own research. Therefore, it was difficult for students to approach faculty with as important a personal decision as a career choice. There were few norms in the medical school to support seeking this kind of guidance. Although some faculty advisor/advisee programs have been attempted, they have been generally unsuccessful. From the student point of view, this lack of success is due to faculty time constraints and indifference. It may be that non-faculty counselors are needed who can provide both the time and perspective necessary for effective



career planning. Perhaps part-time clinical faculty can be encouraged to perform this type of function although they too are time constrained.

Many of these conclusions and implications are not new to medical educators. What is unique about them is that the conclusions are drawn from data on the interaction between learning styles and the medical school environment. It is this interaction between student styles and the medical education process that seems to have some of the most important implications for strategies to encourage or discourage the selection of particular careers by students.



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